PATENT SPECIFICATION

DRAWINGS ATTACHED

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COMPLETE SPECIFICATION

Device for Dispensing Portions of Liquid, Particularly of Spirituous Liquors

I, WALTER SCHERB, an Austrian citizen, of Bernaschekplatz 3, Linz-Urfahr, Upper Austria, trading as S. SPITZ KOMMANDITGESELLSCHAFT, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The invention relates to a device for dispensing portions of liquid, particularly of spirituous liquors, from bottles and for registering said dispensed liquid by a counter while being protected by a lead seal or the like against unauthorized removal. Various portion-dispensing and counting devices for dispensing spirituous liquors from bottles have been disclosed but all of them have failed to meet all requirements to be fulfilled by such devices. Above all, many of the known devices fail to prevent an adulteration of the contents of the bottle, i.e. the replacement of the original filling provided by the manufacturer by an inferior liquid provided by the dealer. For this purpose the renewed filling of the bottle, e.g., through an air intake duct, without removal of the dispensing device from the bottle, must be prevented. Moreover, it must be impossible to remove the dispensing device without injuring a lead seal or the like. Finally, the counter must enable a precise rather than an only approximate registration of the dispensed liquid so that not only the number of glasses dispensed, which have been filled to a higher or lower degree, is shown but the exact amount taken can be read at any time irrespective of the manner of actuation during dispensing. This last requirement is not fulfilled, e.g., if only a measuring space is filled by suction and is then emptied by tilting the bottle because it is not ensured in this case that the measuring space was actually filled entirely rather than partly before it was tilted. Only an exact registration of the dispensed amounts enables, e.g., in the case of a replacement of staff, a simple reading and accounting of the numerical values for the previously dispensed amounts and the handing over to the new staff of the exact quantity of the remainder in the bottle without any mistrust and risk.

The device according to the invention is designed perfectly to fulfil the above said requirements. According to the invention this is achieved in that it comprises a connecting part which is mounted like a closing cap on the rim bead of the bottle and which is connected in a gastight manner to a riser pipe extending into the bottle and contains a bottom valve which closes the riser pipe against return flow; furthermore, the device has openings for admitting air into the bottle, which openings are so small and arranged in such a manner as to preclude a refilling of the bottle therethrough; finally, a measuring device mounted on the connecting part comprises a measuring piston which is displaceable between stops and cooperates with the bottom valve in the connecting part for conveying the liquid, said piston incorporating a piston-controlled discharge valve and engaging the stepping device of a counter. The measuring piston is preferably under the action of a return spring and is adjustable by a manual operating member, which acts through the intermediary of a pawl lever on a finely toothed input gear of the counter, whereby even partial strokes of the measuring piston which are smaller than the full stroke of the overflow valve are recorded by the counter.

Further features and advantages of the invention will be apparent from the illustrative embodiments which will be explained in more detail hereinafter with reference to the accompanying drawings, in which:—

[*Price 3s. 6d.*]

Fig. 1 is a vertical axial sectional view showing a measuring piston portioning device mounted on a bottle head provided with an edge bead. Fig. 2 is a sectional view taken on line II—II of Fig. 1. Fig. 3 shows the ratchet and pawl gear viewed in the plane of section III—III of Fig. 2 and Fig. 4 is a sectional view taken on line IV—IV of Fig. 1 through the valve stem, viewed from below.

Fig. 5 shows another embodiment partly in an axial sectional view. Fig. 6 is an enlarged view showing the top rim of the measuring cylinder thereof. Fig. 7 is a top plan view of the measuring cylinder. Fig. 8 is a vertical sectional view of the connecting part containing the bottom valve. Fig. 9 is an enlarged vertical sectional view of the valve carrier and Fig. 10 is an axial sectional view of a cover cap for the bottle in transit.

The portion-dispensing and -counting device according to Figs. 1 to 4 comprises a substantially tubular casing 30, which is preferably made of plastic. The metering or measuring piston 31 is mounted for vertical sliding movement in an exactly cylindrical bore 38 of the casing 30, the measuring cylinder, and has on its outside periphery one or more annularly closed resilient sealing beads 32 and a central cylindrical bore, through which the shank 34 of the push button 33 extends. The push button 33 is vertically displaceable in a cylindrical bore of the casing 30 until the lower edge 35 of its outside periphery engages the intermediate bottom 36 of the casing 30 and is then returned upwardly to its initial position by the compression spring 37.

The valve member 39 of the piston-controlled discharge valve is affixed to the shank 34 of the push button 33 and is larger in diameter than the stem 34 and has at its outside periphery a resilient annular sealing bead 40, which fits an annular groove in the bottom of the piston 31 and under the strong upward pressure of the spring 37 ensures a tight seal between the valve seat on the piston 31 and the valve member 39. The shank 34 of the push button 33 forms at its lower end a valve stem, which is reduced in diameter and somewhat longer than the thickness of the piston 31. As a result, the shank 34 of the push button 33 has an annular shoulder 41, which is supported by the rim of the bore of the measuring piston 31 and thus carries the measuring piston 31 along when the push button 33 is depressed. Because the length of the reduced diameter portion of the valve stem somewhat exceeds the thickness of the measuring piston 31, however, the depressing of the push button causes the sealing bead 40 to be urged out of the opposite annular groove of the piston 31 so that the piston-controlled discharge valve is opened and the liquid in the measuring cylinder 38 passes upwardly through the flow channels 42 beyond the measuring piston 31 when the depressing of the measuring piston is continued. The lower end of the pump cylinder consists of a connecting part 43, which consists preferably of plastic and is centrally depressed in the form of a cup and has here in a chamber 43a a valve plate 43b, which forms the bottom valve of the piston pump and is connected to the riser pipe 12 extending to the bottom of the bottle. The bottle valve 43b is closed during the descent of the measuring piston 31. When the push button 33 is released, the strong compression spring 37 first closes the piston valve 39, particularly because it is much more difficult to move the measuring piston 31 in the measuring cylinder 38 than the valve stem in the piston bore. As the upward movement of the measuring piston 31 is continued the bottom valve 43b is opened to permit new liquid to follow up from the interior of the bottle 7 through the riser pipe 12 into the measuring cylinder 38. The accurately measured amount of liquid above the measuring piston 31 flows out through the outlet pipe 44 during the upward movement of the measuring piston 31 and may be conveniently collected in a glass. To prevent any liquid from reaching the compression spring 37 during these operations the intermediate bottom 36 has a sealing bead 45, which tightly surrounds the shank 34 of the push button 33.

An amount of air which corresponds to the amount of liquid which has been removed by pumping is supplied to the interior of the bottle through an air equalizing pipe 46. This is arranged to practically preclude an unauthorized refilling of the bottle, as is readily apparent from Fig. 1. The air equalizing pipe 46 has, on the one hand, a very small cross-section. On the other hand, it does not directly open into the atmosphere but terminates in a bore below the outlet pipe 44 and is connected to the outer atmosphere by a groove 47^1 in the outlet pipe 44. This groove leads from the upper end of the air equalizing pipe 46 to a bore 47, which is also thin and lies beside the pipe 46 and which leads towards the outside. This arrangement has the additional advantage that in transit, e.g., it is sufficient to turn the outlet pipe through 180° in order to interrupt the connection between the air equalizing pipe 46 and the bore 47 which extends to the outside so that a leakage of liquid is prevented. The connecting part 43 has on the inside of its outer periphery a sealing bead 48, which fits exactly the groove in the rim of the bottle neck. An appropriate sealing band of the casing 30 snaps into a groove 50 formed in the outside periphery of the sealing bead 48. Thus, the measuring piston portioning device is closed and is firmly secured to the bottle where it is protected against unauthorized

removal by a fixing and tightening clip 51 and a lead seal 52.

The portions are counted by means of a standard counter 53 of special type with the aid of a pawl and ratchet gear (Fig. 3), which is arranged to register even a fraction of the entire stepping increment (even the small distance by which the main valve opens before the movement of the measuring piston begins) so that is practically impossible to take contents without registration by the counter. The lever 54 of the pawl and ratchet gear (Fig. 3) is positively actuated by the push button 33; this cannot be influenced from the outside. The pawl and ratchet gear (Fig. 3) is returned to its initial position by a return spring 55 when the push button moves upwardly. Upon actuation of the push button 33 a spring 56 connected to the lever 54 advances the ratchet wheel 57 connected to the "units" drum of the counter 53. A second spring 58 of the same type, which is anchored in the body below the ratchet wheel 57, prevents a return rotation of the ratchet wheel 57. The lateral cover plate 59 (Fig. 2) and the pane of the counter window 60 preclude an unauthorized tampering with the counter without damage thereto.

Figs. 5 to 10 show a further improved embodiment of the dispensing and portioning device. This dispensing device is mounted in the factory on the filled bottles intended to be provided therewith and is then provided with a lead seal and is delivered to the customers in this condition. It has been found that when these bottles provided with the counting portioning device have been emptied they are not exchanged against full bottles in most cases until the next call of a salesman. As a result, at least two bottles which are being returned or refilled must be calculated for each bottle which is in use. In the bottles being returned or refilled the counting portioning device is not required and its existence is uneconomical in view of its relatively high cost. This disadvantage is eliminated in the embodiment of Figs. 5 to 10 in that the connecting part mounted like a closing cap on a rim bead of the bottle consists of a part which can be separated from the casing of the portioning device whereas mating sealing surfaces are provided on said part and on the casing to enable a mechanically firm, gastight connection of this part to the portioning device. This ensures that the relatively expensive counter and portioning device may constantly remain in use whereas reserve bottles without portioning device can be kept in stock and delivered. This is much less expensive. This arrangement affords the following additional advantages:—

a) The counting portioning device may be used by the customer only in connection with an original bottle rather than for other purposes because it lacks the bottom valve, which is essential for its function.

b) The bottle can be refilled only in the manufacturer's own plant rather than by an unauthorized person. Because it is unusable without the counting portioning device it cannot be put to an uncontrolled use

c) The manipulation at the manufacturing plant is simpler because the lead-sealing of the counting portioning device is eliminated and the shipping package for the bottles is reduced in length by the length of the counting portioning device, whereby the cost of the package is reduced and the bottles thus packed require a small shipping space.

The device according to Figs. 5 to 10 comprises a casing 30, a pump piston 31, a manual actuating member in the form of a push button 33, and a counter 53 which extends transversely out of the casing.

The measuring cylinder 38 consists of a cylindrical vessel which is separate from the casing 30. In order to compensate the volume of liquid removed from the bottle, channels are provided which are formed by groovelike longitudinal recesses 63 machined in the outside wall of the measuring cylinder 38. These grooves open at the top into an annular groove 63 (Fig. 6), which is provided at the upper outer rim of the measuring cylinder 38 and leads through a channel 65 and a corresponding milled recess 66 of the outlet pipe 44 into the open.

When the portioning device has been mounted on the bottle, three or more depending feet 68 provided at the bottom 67 of the measuring cylinder 38 engage the upper rim of the connecting part 69, which is mounted on the bottle. Thus, these feet hold the measuring cylinder 38 in its effective operating position and permit air to pass through between these feet 68 and flow through the air equalizing grooves 63 to the interior of the bottle.

The connecting part 69 consists preferably of a plastic which is resilient but stiff and very strong and has two sealing beads 70 and 71, which snap under appropriate initial stress into the annular grooves 72 of the discharge head of the bottle 7 or behind an annular bead 73 of the bottle head. As a result, the connecting part 69 forced onto the bottle is a very firm and tight fit thereon and cannot be removed without a special tool.

The bottom valve 43a is arranged in the connecting part 69 and extends into the interior of the bottle. The riser pipe 12 is downwardly inserted into this bottom valve and extends as far as to the bottom of the bottle. The bottom valve 43a has an upward tubular extension 74, which sealingly snaps into a connecting socket 75 provided on the bottom 67 of the measuring cylinder 38 when the portioning device is being mounted. To facilitate the introduction of the tubular exten-

sion 74 into the connecting socket 75, the upper edges of the extension and particularly the lower edges of the socket are highly rounded. To ensure a reliable, airtight fit, the connecting socket 75 is provided with an annular sealing bead 76. The bottom valve 43a has a body 77, which is formed with machined overflow channels 78. The body 77 is closed from below by a cap 79, into the tubular extension of which the rising pipe 12 is inserted as a tight fit. Thus, the rising pipe 12 extends upwardly from the bottom of the bottle and opens in the interior of the cap 79 in an annular bead 80, which is formed as a valve seat. The hollow space of the body 77 contains the hollow carrier 81 (Fig. 9) for the valve plate 82 and a helical spring 83, which bears upwardly against the rim of the tube 74 and is fitted at its lower end on the tubular extension 84 of the valve carrier 81 and urges the point 85 against the centre of the resilient valve plate 82. Thus a perfectly tight fit of the valve is ensured even if the valve carrier 81 is canted or in the case of a distortion, which cannot be precluded if it is manufactured of plastic. The resilient valve plate 82 is flexed at its centre and urged against the valve seat 80 by the cone point 85 under the pressure of the spring 83. To prevent the valve plate from adhering to the rear wall of the valve carrier 81, which would reduce or eliminate its sealing action, this rear wall is formed with apertures 86. The resilient valve plate is protected from falling out by the annular bead 87 of the valve carrier. In order to ensure an adequate cross-section of flow even when the valve carrier is lifted as far as to the stop by the liquid flow, the valve carrier has some projections 88 spaced around the periphery of its upper edge.

The connecting part 69 has at the top an annular sealing bead 89 and next to it an annular groove 90. The bead 89 is intended to be received in the corresponding annular groove 91 whereas the groove 90 is intended to receive the sealing bead 92 of the portioner casing 30 snapping into it as a tight fit. A supporting insert 93 preferably made of hard plastic is provided to prevent a deformation of the sealing bead 89 and an addition of the elastic action of two parts during the mounting of the portioning device. The stiffening of the connecting part by the supporting insert 93 is also important because it is a preferred practice to carry the entire bottle depending from the portioning device. For this purpose it is intended to clamp the bottle by means of a tightened clip 51 in conjunction with a wing screw 94.

The supporting insert 93 snaps with its upper edge 95 behind an annular bead 96 of the connecting part and can be removed only with special tools and in no case by an unauthorized person.

The lower inner edge of the funnel-shaped portion 97 of the supporting insert 93 engages the bottom of the connecting part 69. The connecting part 69 is formed below the funnel-shaped portion 97 of the supporting insert 93 with two openings 98 and 99, the opening upper rim of which lies above the lower rim of the supporting insert and which are preferably closely spaced although they are shown to be diametrically opposite in the drawing. Finally, the lower rim of the funnel-shaped portion 97 of the supporting insert 93 has one or two notchlike apertures 100, which are preferably disposed closely to the openings 98 and 99 and through which air can enter the interior of the bottle when the portioner has been mounted whereas it is not possible to effect an unauthorized or undesired refilling of the bottle through this system of openings so as to endanger the original character of the contents of the bottle.

In the manufacturing plant the supporting insert 93 may be removed with the aid of a special tool and the bottle may then be refilled through the openings 98 and 99 without need for renewing also the connecting part 69.

Because the valve 43a acts as a check valve inasmuch as it permits only of pumping liquid out of the interior of the bottle whereas it prevents the entrance of liquid or air into the bottle through this valve and because the afore-described system of openings 98, 99 and 100 prevents also a refilling, it is sufficient to close the bottle closure in transit with a cover cap 101 (Fig. 10), which is easily removable with the aid of a grip nose 102.

The outlet tube 44 is inclined towards the outside to promote a stripping of the last drop by the rim of the glass.

WHAT I CLAIM IS:—

1. A device for dispensing portions of liquid, particularly of spirituous liquors, from bottles and for registering said dispensed liquid portions by a counter, while being protected against unauthorized removal by a lead seal or the like, characterized in that it comprises a connecting part which is mounted like a closing cap on a rim bead of the bottle and which is connected in a gastight manner to a riser pipe extending into the bottle and contains a bottom valve which closes the riser pipe against return flow, and that it has openings for admitting air into the bottle, which openings are so small and arranged in such a manner as to preclude a refilling of the bottle therethrough and that finally a measuring device mounted on the connecting part comprises a measuring piston which is displaceable between stops and cooperates with the bottom valve in the connecting part for conveying the liquid, said measuring piston incorporating a piston-controlled discharge valve and engaging the stepping device of the counter.

2. A device as claimed in Claim 1, characterized in that the measuring piston is under the action of a return spring in a manner known *per se* and is adjustable by a manual operating member, which acts through the intermediary of a pawl lever on a finely toothed input gear of the counter, whereby even partial strokes of the measuring piston which are smaller than the full stroke and of the piston-controlled discharge valve are registered by the counter.

3. A device as claimed in Claim 1, characterised in that the piston-controlled discharge valve is arranged to be opened and closed by a manual operating member having a shank projecting through an opening in the measuring piston and having a valve member formed with a sealing bead which in the closed position of the discharge valve cooperates with a corresponding groove in the measuring piston, flow channels being machined in the wall of the shank to permit the discharge of liquid through the measuring piston when the piston-controlled discharge valve is open.

4. A device as claimed in Claim 1, characterised in that the connecting part mounted like a closing cap on a rim bead of the bottle consists of a part which can be separated from the casing of the portioning device and which can be mechanically firmly and gastightly connected to the portioning device by means of mating sealing surfaces provided on said connecting part and said casing.

5. A device as claimed in Claim 4, characterised in that the casing and the connecting part are each formed with a bead and a groove which are alternatingly a sealing fit with each other and can be forced into engagement by a tightened clip.

6. A device as claimed in Claim 4, characterised in that the measuring cylinder is inserted in the casing as a separate part and is formed on its periphery with grooves which serve for admitting air into the bottle.

7. A device as claimed in Claim 4, characterised in that the connecting part has an upwardly protruding rim, formed with the sealing surfaces and made of a somewhat elastic plastic, the said rim being stiffened by a funnel-shaped insert, which is made of hard plastic and around the bottom portion of which several small radial openings are provided for admitting air into the bottle.

8. A device as claimed in Claim 1, characterized in that a channel is provided for admitting air into the bottle and is adapted to be connected to the open by a longitudinal groove formed in the outside wall of the rotatable outlet pipe whereas the channel is adapted to be closed by a rotation of the outlet tube.

9. A device for displacing portions of liquid and for registering said dispensed liquid by a measuring device while being protected by a lead seal or the like against unauthorized removal, substantially as described hereinbefore with reference to and as shown in Figs. 1 to 4 or 5 to 10 of the accompanying drawings.

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6, Bream's Buildings, London, E.C.4.

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Fig.1

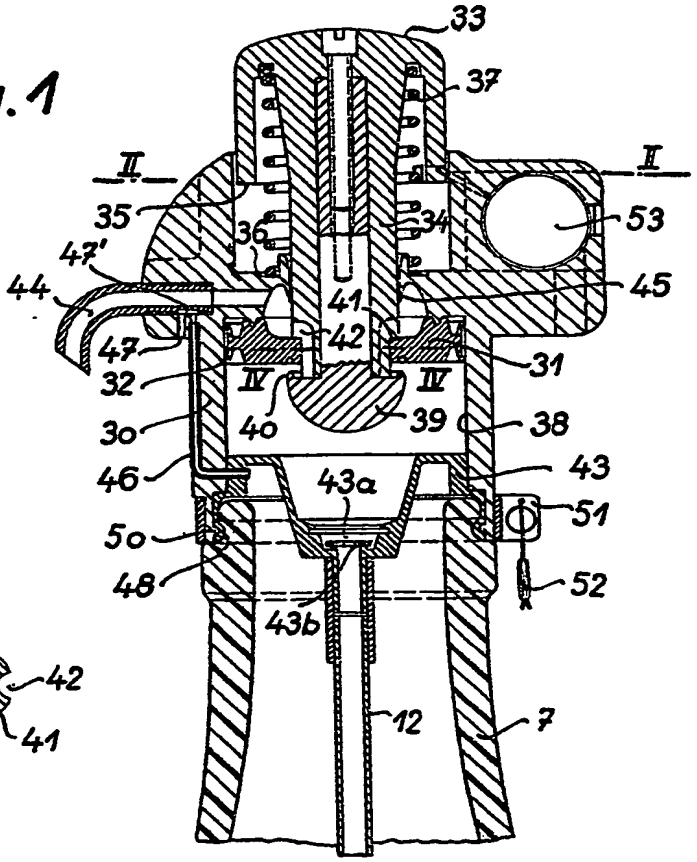

Fig.4

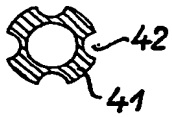

Fig.2

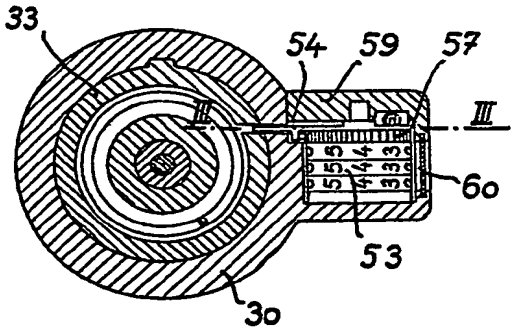

Fig.3

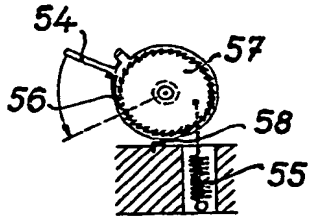

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Fig.5

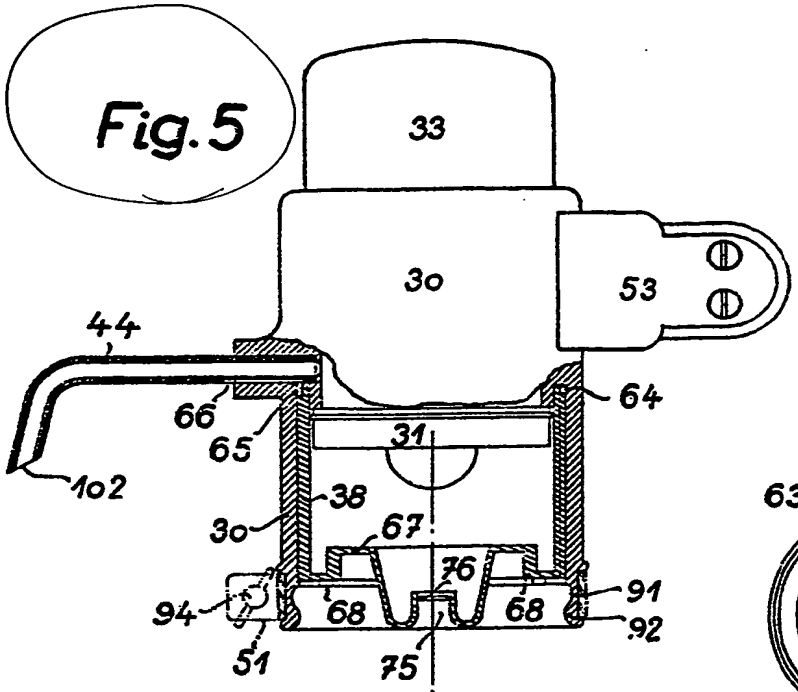

Fig.6

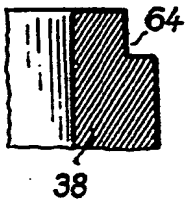

Fig.7

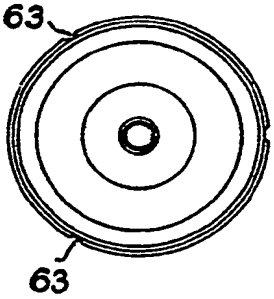

Fig.10

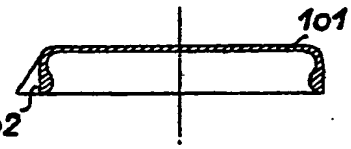

Fig.8

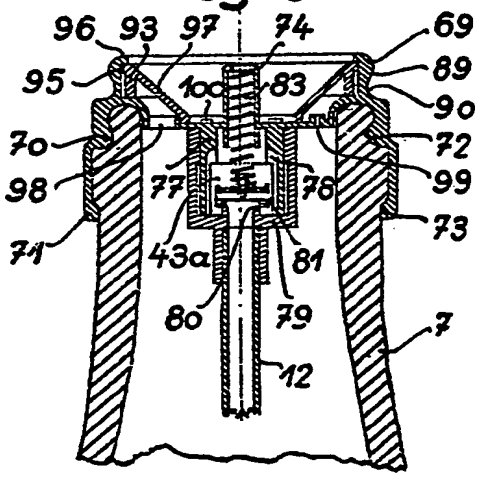

Fig.9

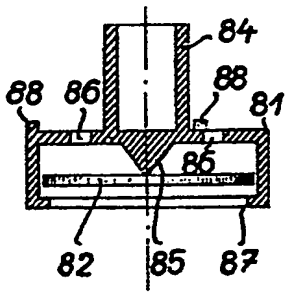

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Fig.1

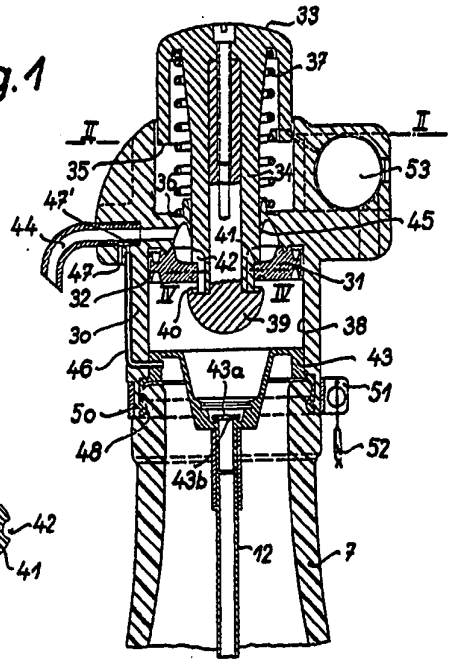

Fig.4

Fig.2

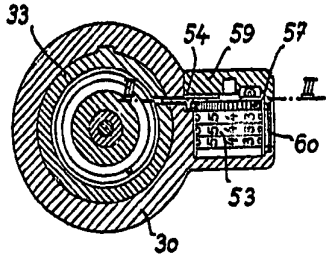

Fig.3

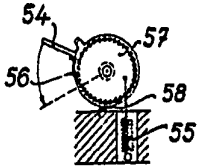

Fig.5

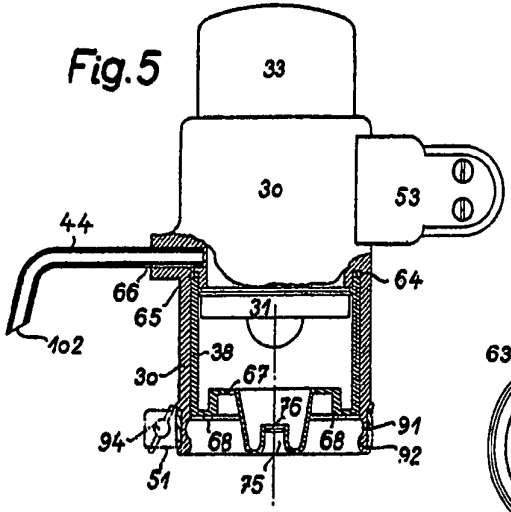

Fig.6

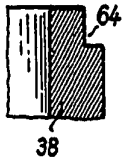

Fig.7

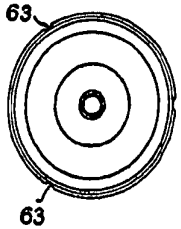

Fig.10

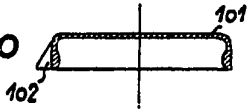

Fig.8

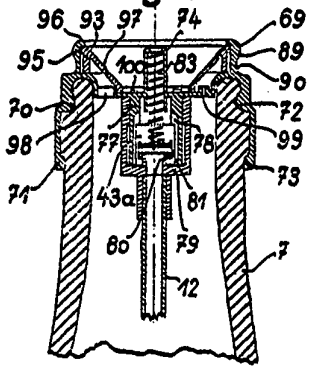

Fig.9